

blackened along the course pursued by the electricity. Concord, N. H., 21st, the wires in the Telephone Exchange were completely burned out, stopping all communication with surrounding towns. Schuylkill and Columbia Co's, Pa., 29th, most violent thunder storm for years; several persons killed by lightning and many buildings along the course of the storm badly shattered or burned. Wauwaukee, Wis., 20th, most violent thunder storm for past 25 years; the electricity tore a hole about 6-by 4 feet in the roof of a house and, passing thence down the chimney, demolished every wire-screen door in the building without injuring the occupants; 26 pigs, lying under a tree 25 rods from the house, were instantly killed. Fremont, Ohio, 8th, three horses instantly killed in an open, treeless field. Chicago, 20th, house struck, tearing off the shingles and siding as though so much paper; the electricity appeared to envelop the whole building, knocking the chimney into sections, cracking the stove and demolishing the windows; one person instantly killed in a group of three and the others seriously stunned. Columbus, Ohio, 22nd, house struck, tearing the chimney to pieces and filling the rooms with soot; the inmates were not injured in the least. Delaware, Ohio, 22nd, at a point about 8 miles west of town, electricity passed down the chimney of a house, splintering several joists; then moving onward and down the sides of the building it entered the room below, tearing a bed into shreds; from here it passed to a cook stove in an adjoining room, breaking it into innumerable pieces, and passing thence to a man who stood near, ran down his arm and leg and disappeared through the floor, in which it left a large hole. This person complained afterwards of sharp pains passing from one leg to the other, and was unable to close his hand.

Atmospheric Electricity Interfering with Telegraphic Communication.—Fort Missoula, Mont., 19th; Umatilla, Or., 2nd, 19th, 29th; Phoenix, Ariz., 23rd; Camp Grant, 21st, 23rd; Fort Cummings, 11th; Concho, 1st, 11th, 15th; Fort Davis, 8th and 16th; Decatur, 11th and 26th; Jacksboro, 1st, 15th; Fort Sill, 14th, 21st, 30th; Fort McKavitt, 1st, 2nd, 14th; Eagle Pass, 1st; Castroville, 2nd, 16th; Uvalde, 16th, 17th; Bismarck, 18th 19th; La Crosse, 21st; Mason, 15th, 16th; Fredericksburg, 15th, 16th; Mount Washington, 16th, the electricity entered the printing office at the summit, scattering a case of type; it also burnt one of the wires in the telegraph office; in the Signal office it burnt the telephone wires, passed half way round the room, burning the wires in several places and scorching the woodwork.

Auroras.—The display of the 2d was the most widely observed of any reported during the month, the line of observation continuing westward from Sydney, N. S., to Bismarck, and northward from the 39th parallel to Duluth. The following stations reported, and generally between the hours of 9 p. m. and midnight: Halifax, N. S., Charlottetown, P. E. I., Toronto, Can., Gardiner, Me., Eastport, 9.15 to 11.30 p. m.; Portland, 9 p. m. until after midnight; New Haven, 9 p. m. until after midnight; Strafford, Vt., Contoocookville, N. H., Williamstown, Mass., Cambridge, Mass., Fall River, Mass., Springfield, Mass., Newport, R. I., 10 p. m. until after midnight; Freehold, N. J., Little Egg Harbor, N. J., Ithaca, N. Y., Sandusky, Ohio, Toledo, 10 p. m. until midnight; Detroit, 10 p. m. until after midnight; Grand Haven, 9.30 p. m. until after midnight; Madison, Wis., Mission House, Wis., Clinton, Ia., Ft. Madison, Ia., Duluth, 8.30 to 10.50 p. m.; Huron, Dak. Ty., 9.30 p. m. until after midnight; Bismarck, 10 p. m. until after midnight. The display of the 3d, a continuation, in most cases, of the 2d, was visible at scattering stations from Eastport westward to Yankton, and generally between midnight and 2 a. m.; Eastport, midnight to 2 a. m.; Newport, midnight to 1 a. m.; Grand Haven, midnight to 2 a. m.; Monticello, Iowa, midnight to 2.30 a. m.; Clear Creek, Nebr., midnight to 2 a. m.; Yankton, 8 to 9 p. m. Isolated displays were reported as follows: Westborough, Mass., 5th, 10.30 p. m.; Fall River, Mass., 6th, 15th; Newport, Vt., 29th; Madison Barracks, N. Y., 29th, 9.25 p. m.; Montreal, Can., 29th; Burlington, Vt., 22d, 10 to 11 p. m.; 23d, 9 to 11 p. m.; 29th, 10 p. m. to midnight; Toronto, Can., 25th, 29th; Halifax, N. S., 31st; Sydney, N. S., 24th, 25th; Fallsington, Pa., 21st, 31st; Vevay, Ind., 26th, 27th. (29th, 9.55 p. m.); St. Paul, Minn., 1st, 8.30 to 11 p. m.; 12th, 9 to 11.20 p. m.; 13th, 9 to 11 p. m.; Embarrass, Wis., 24th; St. Vincent, Minn., 12th, 9.40 p. m. until midnight; Ft. Stevenson, Dak., 17th.

Zodiacal Light.—Nashville, Tenn., 16th, 18th, 20th, to 23rd, 25th, 27th, to 31st, Monticello, Ia., 19th, 25th, 30th; Cambridge, Mass., 19th; Northport, Mich., 13th.

OPTICAL PHENOMENA.

Solar halos have been observed in the various districts on the following dates: New England, 3rd, 7th, 18th, 25th, 27th; Middle Atlantic states, 9th, 15th, 22nd, 29th, 30th; South Atlantic states, 6th, 7th, 29th; Florida, 12th and 30th; Eastern Gulf states, 30th; Texas, 14th; Ohio valley and Tennessee, 4th, 11th, 12th, 13th, 18th, 20th, 26th, 30th; Lower Lake region, 26th; Upper Lake region, 2nd, 3rd, 11th, 14th, 16th, 26th; Upper Mississippi valley, 13th; Missouri valley, 9th, 13th, 27th, 29th; Middle Slope, 11th 14th; Middle Plateau, 5th, 8th, 13th; Northern Pacific coast region, 24th, 29th.

Lunar halos have been observed in the various districts on the following dates: New England, 1st, 4th, 10th; Middle Atlantic states, 4th, 5th, 7th, 9th, 11th to 15th; South Atlantic states, 4th, 7th, 10th, 11th, 13th; Eastern Gulf states, 5th, 9th, 12th; Western Gulf states and Texas,

1st, 3rd to 9th, 11th, 14th, 20th; Ohio valley and Tennessee, 11th 13th, 14th, 15th, 16th, 19th, 24th; Lower Lake region, 7th, 10th to 13th, 15th; Upper Lake region, 12th, 14th; Upper Mississippi valley, 2d, 6th, 9th, 11th; Missouri valley, 1st, 9th, 14th; Southern Plateau, 7th 8th, 31st.

MISCELLANEOUS PHENOMENA.

Sunsets.—The characteristics of the sky at sunset as indicative of fair or foul weather for the succeeding twenty-four hours have been observed at all Signal Service stations. Reports from 183 stations show 5,625 observations to have been made, of which 28 were reported doubtful; of the remainder, 4,644, or 83.0 per cent., were followed by the expected weather.

Sun Spots.—The following record of observations, made by Mr. D. P. Todd, Assistant, has been forwarded by Prof. S. Newcomb, U. S. Navy, Superintendent, Nautical Almanac Office, Washington, D. C.:

DATE— July, 1881.	No. of new—		Disappeared by solar rotation.		Reappeared by solar rotation.		Total number visible.		REMARKS.
	Groups	Spots.	Groups	Spots.	Groups	Spots.	Groups	Spots.	
1, 5 p. m.....	1	2	0	0	1	2	6	45†	Many of the spots small.
2, 8 a. m.....	0	0	0	0	0	0	6	40†	
3, 5 p. m.....	1	5	0	5	1	5	7	35†	
4, 1 p. m.....	0	0	1	5	0	0	6	25†	
5, 8 a. m.....	2	10	0	0	0	0	8	35†	
6, 11 a. m.....	0	0	1	5	0	0	6	25†	
7, 8 a. m.....	1	10	1	5	1	5	6	30†	
8, 6 p. m.....	0	6	1	5	0	0	5	35†	
9, 11 a. m.....	1	1	0	0	1	1	5	35†	
10, 8 a. m.....	0	0	0	0	0	0	5	30†	
11, 4 p. m.....	0	0	0	0	0	0	4	25†	Many of the spots small.
12, 7 a. m.....	0	0	0	5	0	0	4	20	
13, 10 a. m.....	0	5	1	5	0	0	2	20†	
14, 12 m.....	1	3	0	5	1	3	3	15	
15, 6 p. m.....	1	3	0	5	0	0	4	13	
16, 11 a. m.....	0	4	1	5	1	2	4	15	
17, 6 p. m.....	1	15	0	5	2	10	8	25†	
18, 8 a. m.....	4	20†	1	5	0	0	7	40†	
19, 9 a. m.....	0	25†	0	5	0	0	7	65†	
20, 5 p. m.....	0	0	0	5	0	0	7	60†	
21, 9 a. m.....	0	0	0	5	1	2	7	65†	Many of the spots small.
22, 8 a. m.....	1	10	1	5	1	2	8	65†	
23, 8 a. m.....	1	2	0	5	1	2	8	65†	
24, 10 a. m.....	2	5	1	5	2	5	8	60†	

† Approximated.

Faculae were seen at the time of every observation

Mr. H. D. Gowey, at North Lewisburg, Ohio, reports: Spots observed every day during the month, most numerous, 1st; fewest 17th; largest, during the latter part of the month. Mr. D. Trowbridge, at Waterburg, N. Y., reports as follows: 1st, 5 groups, 9 spots, 1 group just appearing by solar rotation; 2nd, same as observed on 1st, 7 spots; 5th, 2 groups, 3 spots, 1 new group appeared by solar rotation; 6th, 3 groups, 7 spots, 1 group near the middle of the disk, not seen on the 5th; 9th, 5 groups, 6 spots, 1 group just appeared by rotation; 11th, 3 groups, 7 spots, 2 were bright and large; 12th, 4 groups, 6 spots, 3 groups same as observed on 11th, and one new small spot; 13th, 4 groups, same as observed on 12th, 5 spots; 15th, 2 groups, 3 spots, 1 group disappeared by rotation and one gone out; 16th, 1 group, 4 spots, 1 group gone out; 18th, 3 groups, 3 spots, largest group observed on the 16th, has disappeared by rotation, 2 groups supposed to have appeared by rotation; 19th, 2 groups, 5 spots; 21st, 3 groups, 4 spots; 22d, 4 groups, 4 spots, 1 new group appeared by rotation; 24th, 5 groups, 8 spots; 25th, 4 groups, 13 spots, same groups as observed on 24th; 26th, 5 groups, same as 25th; 28th, 4 groups, 9 spots, cloudiness interfering with observation; 30th, 7 groups, 19th spots, 1 very fine group; 31st, 6 groups, 10 spots, some changes.

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